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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte J. BARRY NOAR

Appeal 2016-004275
Application 12/865,765¹
Technology Center 1700

Before BRADLEY R. GARRIS, GEORGE C. BEST, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

DENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL²

STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134 from a rejection of claims 1 and 10. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellant identifies the real party in interest as Singlogen Inc. Appeal Br. 4.

² In our Opinion below, we refer to the Final Action delivered electronically on May 6, 2014 (“Final Act.”); the Advisory Action delivered electronically on December 10, 2014 (“Advis. Act.”); the Appeal Brief filed February 26, 2015 (“Appeal Br.”); the Examiner’s Answer delivered January 11, 2016 (“Ans.”); and the Reply Brief delivered electronically on March 11, 2016 (“Reply Br.”).

The claims are directed to a method to confer transient water solubility on a water insoluble aluminum phthalocyanine and to deposit the aluminum phthalocyanine into or onto a material with the loss of the transient water solubility. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A method to confer transient water solubility on a water insoluble aluminum phthalocyanine and to deposit the aluminum phthalocyanine into or onto a material with the loss of the transient water solubility, comprising:

forming a mixture comprising said aluminum phthalocyanine and a polyethylene glycol derivative, wherein said mixture is formed in the absence of solvent;

heating the mixture in the absence of solvent to between 200 to 350°C to form a complex between said aluminum phthalocyanine and said polyethylene glycol derivative;

recovering the complex in a first aqueous solution;

contacting the material with the complex in the first aqueous solution, wherein the complex dissociates and deposits the aluminum phthalocyanine into or onto the material in a water insoluble form; and

removing undeposited complex by washing the material with a second aqueous solution.

Appeal Br. 11 (Claims App'x).

REFERENCES

The Examiner relies on the following prior art in rejecting the claims on appeal:

| | | |
|-----------------------------------|-----------------|---------------|
| Dandliker et al. ("Dandliker") | US 5,641,878 | June 24, 1997 |
| Devlin et al. ("Devlin") | US 6,060,598 | May 9, 2000 |
| Buechler et al. ("Buechler") | US 7,322,927 B2 | Jan. 29, 2009 |

REJECTIONS

The Examiner maintains the rejection of claims 1 and 10 under 35 U.S.C. § 103(a) over Buechler in view of Dandliker and Devlin. Final Act. 3.

OPINION

Only claim 1 and its dependent claim 10 are pending. Appeal Br. 5. Appellant has not presented separate arguments specifically directed to dependent claim 10. As a consequence, claim 10 will stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

Buechler is the primary reference on which the Examiner bases the obviousness rejection of claim 1. *See* Final Act. 3. Appellant contends that the Examiner confuses Buechler's teachings concerning water ***soluble*** metal-coordinated organic molecules and water ***insoluble*** metal-coordinated organic molecules. Appeal Br. 7. Specifically, Appellant argues that Buechler does not teach that water ***soluble*** phthalocyanine dyes can or should be deposited in or on a latex matrix, urging that "nothing in the primary Buechler et al. reference even hints that one could or should confer

water solubility transiently on a water insoluble aluminum phthalocyanine, and then deposit the aluminum phthalocyanine into or onto a material with the loss of that transient water solubility, as taught by the present invention and claims.” *Id.* at 7–8 (emphasis in original). Appellant points to the following same three excerpts of Buechler in the Appeal Brief and Reply Brief as support for the argument that the reference “clearly distinguishes between insoluble dyes suitable for particles, and water soluble dyes”:

The methodology teaches improved methods for incorporation of dyes into particles to minimize fluorescence quenching and to maximize fluorescence intensities of the dye molecules in the particles. In addition, the design and synthesis of novel hybrid phthalocyanine derivatives are described which are incorporated into particles or are synthesized as water-soluble molecules for use as labels and are directly coupled to proteins, polypeptides, other labels, nucleic acids and the like. Buechler col. 2, ll. 41–49 (emphasis Appellant’s).

The hybrid phthalocyanine derivatives may also be synthesized as water soluble compounds to be used for direct attachment to proteins, polypeptides other labels or nucleic acids. *Id.* col. 7, ll. 30–33 (emphasis Appellant’s).

The fluorescent conjugates of water soluble hybrid phthalocyanine derivatives, which are smaller in molecular weight than the fluorescent particles described herein, will diffuse faster in solution and result in binding reactions which have faster kinetics. Fast kinetics of the binding reactions in assays are preferred because the assays will reach equilibrium binding in a shorter time, and in turn, assay results can be obtained in a shorter time. *Id.* col. 22, ll. 29–36 (emphasis Appellant’s).

Appeal Br. 7–8, Reply Br. 4–5. Appellant thus contends that Buechler’s disclosure is limited to teaching incorporation of water ***insoluble*** metal-coordinated organic molecules into latex.

Appellant limits contentions regarding the secondary references to the argument that nothing in the secondary references cures the alleged failure of Buechler to suggest that water solubility should be introduced transiently to deposit a phthalocyanine onto a surface. Appeal Br. 9–10. Any additional argument regarding the teachings of the references or their combination with Buechler is waived. *See Hyatt v. Dudas*, 551 F.3d 1307, 1314 (Fed. Cir. 2008).

The Examiner finds that Buechler’s teachings of incorporating dyes into latex particles are not restricted to incorporation of dyes that are water *insoluble*. Advis. Act. 3; Ans. 2. Like Appellant, the Examiner cites excerpts from Buechler in support of this position, including one of the same excerpts cited by Appellant (Buechler column 2, lines 41–49) which we do not repeat here. Ans. 2–3. The Examiner cites Buechler’s Technical Field:

This invention relates generally to the synthesis of novel dyes and labels and methods for the detection or visualization of analytes and more specifically to ***fluorescent latex particles which incorporate the novel fluorescent dyes*** and utilize, in certain aspects, fluorescence energy transfer and intramolecular energy transfer, for the detection of analytes in immunoassays or in nucleic acid assays.

Id. col. 1, ll. 30–36 (emphasis added). The Examiner also cites the following Buechler excerpt:

Another important criteria for preparing particles exhibiting fluorescence energy transfer is the selection of the solvent used to swell and/or imbibe the dyes. The solvent system should penetrate the interior of the particle, for example, ***when using latex particles, and the dyes should also be soluble in the solvent system*** so that the dyes in the solvent can enter the interior of the particle.

Id. col. 9, ll. [50]-65 (emphasis added).

In rejecting claim 1, the Examiner finds that Buechler teaches a method which comprises mixing a metal-coordinated molecule with a water soluble ligand under conditions in which the ligand associates with the metal-coordinated molecule to form a complex between the ligand and the molecule and recovering the complex. Final Act. 3. The ligand may impart water solubility to the metal-coordinated molecule. *Id.* at 4. The Examiner further finds that Buechler teaches the metal-coordinated molecule may be a phthalocyanine and aluminum is a desirable metal center atom, mixing of the metal-coordinated molecule and the ligand occurs in the presence of heat, and the complex may be recovered by dissolution in water. *Id.* The Examiner finds that Buechler teaches a method of depositing a water insoluble metal-coordinated organic molecule onto or into a latex matrix, which method comprises contacting the latex in an aqueous solution of tetrahydrofuran (i.e., a first aqueous solution) with the complex and providing conditions wherein the complex dissociates thus depositing the metal ion-containing organic molecule, being in water insoluble form, in or on the latex matrix, and recovering the matrix containing the organic molecule by solubilizing the dissociated ligand in water. *Id.* at 3–4.

The Examiner acknowledges that Buechler does not explicitly teach a polyethylene glycol derivative, as claimed, but finds that Dandliker teaches polyethylene glycol or polyethylene glycol derivatives as axial ligands complexed to, e.g., phthalocyanine. *Id.* at 4.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the water solubility imparting ligand of Buechler to incorporate a polyethylene glycol derivative, as suggested by Dandliker. *Id.* Dandliker teaches polyethylene

glycol derivatives are suitable for imparting water solubility to phthalocyanine derivatives. *See, e.g.*, Dandliker col. 6, ll. 59–61. One of ordinary skill in the art would have been motivated to substitute the known polyethylene glycol derivatives of Dandliker for the water soluble ligand in Buechler to yield predictable results. *In re Lackey*, 371 Fed. App'x 80, 81 (Fed. Cir. 2010); *see also In re Mayne*, 104 F.3d 1339, 1340 (Fed. Cir. 1997) (“Because the applicants merely substituted one element known in the art for a known equivalent, this court affirms [the rejection for obviousness].”). A claim is obvious where it “simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (quotes and citation omitted).

Buechler teaches forming the complex by mixing the components in a solution. Final Act. 4. The Examiner turns to Devlin for teaching a metal phthalocyanine with polyethylene glycol derivative axial ligands prepared by forming a mixture of the metal phthalocyanine and polyethylene glycol derivative in the absence of a solvent, and heating the mixture in the absence of a solvent to form a complex. *Id.* The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of forming the complex as suggested by Devlin because Devlin shows it is a suitable synthesis method, and the ordinarily skilled artisan would have recognized the environmental benefits of a solvent-free process. *Id.* at 5. The Examiner's explanation of the reasons a person of ordinary skill in the art would have had to combine the prior art teachings is sufficient when an allowance is made for “the inferences and creative steps that a person of ordinary skill in the art would

employ.” *KSR*, 550 U.S. at 418. The Examiner has provided “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. *Id.* (citing *In re Kahn*, 441 F.3d 977, 998 (Fed. Cir. 2006)).

Even though the references do not explicitly disclose the transient water solubility of aluminum phthalocyanine, it is a natural result of the combination of the water insoluble aluminum phthalocyanine when mixed with a polyethylene glycol derivative under the circumstances claimed. *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1195–96 (Fed. Cir. 2014) (confirming the concept of inherency may be applied to obviousness when the limitation at issue is the natural result of the combination of prior art elements). In like manner, dissociation of the complex is a natural result of deposition of the complex on a material such as latex. Thus, all elements of claim 1 are disclosed in the combined references, with the exception of the specific temperature range claimed.

Claim 1 requires heating the mixture in the absence of solvent to between 200 to 350°C. Appeal Br. 11 (Claims App’x). The Examiner acknowledges that the combined references do not explicitly teach heating to the claimed range. Final Act. 5. However, the Examiner points out that, “where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *Id.* (citing *In re Aller*, 220 F.2d 454, 456 (CCPA 1955); see also *In re Woodruff*, 919 F.2d 1575, 1577–78 (Fed. Cir. 1990) (where the difference between the claimed invention and the prior art is some range, the applicant must show that the particular range is critical, generally by

showing that the claimed range achieves unexpected results relative to the prior art range).

For the reasons provided above, Appellant fails to show harmful error in the § 103 rejection of claim 1. We sustain the Examiner's rejection of claim 1. We sustain the rejection of claim 10, which Appellant did not argue separately, for the same reasons.

DECISION

For the above reasons, the Examiner's rejection of claims 1 and 10 is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED